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ABSTRACT

This study demonstrated reinforcement control over pronounced feminine behaviors in a male child who had been psychologically evaluated as manifesting "childhood cross-gender identity." Reinforcement control over cross-gender behavior was demonstrated by identifying some behavioral treatment conditions under which feminine behaviors could be suppressed. Behavioral observations were obtained for several feminine behaviors in the clinic and the home. An intrasubject design insured both replication and reliable identification of relevant treatment variables. The treatment effects were found to be largely response-specific and stimulus-specific. This research suggested a preliminary step towards correcting pathological sex-role development in boys, which may provide a basis for the primary prevention of adult transsexualism, or similar adult sex-role deviation. The clinical history of the subjects paralleled the retrospective reports of adult transsexuals including seven specifically defined variables. (Author)

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BEHAVIORAL TREATMENT OF DEVIANT SEX-ROLE BEHAVIORS IN A MALE CHILD[1]

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Behavioral Treatment of Deviant Sex-Role Behaviors in a Male Child

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Young boys with feminine sex-typed behaviors have recently become the object of increased psychological interest, perhaps because of growing evidence that childhood cross-gender manifestations are indicative of later adult sexual abnormalities, e.g., transvestism, transsexualism, or homosexuality (Green, 1966, 1968; Green and Money, 1961, 1964; Stoller, 1967, 1968, 1970). Anatomically normal male children with pronounced feminine characteristics have been diagnosed as having childhood "cross-gender identity problems" (e.g., Green, 1968). Using behavior modification procedure, we treated a child, Kraig, who exhibited all the psychiatric symptomatology of a typical boy with "cross-gender identification." Prior to treatment, the Director of UCLA's Gender Identity Research and Treatment Program (Dr. R. Green) considered Kraig to be one of the most severe cases he had assessed. Therefore, a clinical description of Kraig's behaviors will serve to illustrate the boyhood cross-gender psychopathology.

Kraig was referred to us for treatment at the age of four years and eleven months. His family was intact, including a brother of eight years and a sister of nine months of

age. Kraig had a history of cross-dressing for nearly three years; he played with clothing and cosmetic items of his mother and grandmother from the age of two years. When mother's clothing was unavailable, Kraig very frequently improvised in cross-dressing--e.g., shirt over head for long hair, or long shirt for a dress. Kraig continually displayed pronounced feminine mannerisms, gestures, and gait, as well as exaggerated feminine inflection and feminine content of speech. He had a remarkable ability to mimic all the subtle behaviors of an adult woman. Kraig seemed void of masculine behaviors, being both unable and unwilling to play the "rough-and-tumble" games of boys his age in his immediate neighborhood. He regularly avoided playing with his brother; he declined to defend himself among peers; and he was very fearful of getting hurt. He preferred to play with girls, and one neighbor girl in particular; even when playing house with the girls, he invariably insisted on playing the part of the "mother" and assigned the part of "father" to one of the girls. Nearly every day, he came crying home to his mother, complaining that the girls refused to let him play as he desired (i.e., to play the part of "mother"). Kraig had a very dependent relationship with his mother; he demanded her attention almost continuously. He appeared to be very skilled at manipulating her to satisfy his feminine interests (e.g., he would offer to "help mommy" by carrying her purse when she had other

packages). In general, Kraig was extremely immature for his age, devoid of normal masculine role behaviors, and compulsive in performing feminine behaviors.

Most adult transsexuals and transvestites and some homosexuals report that their cross-gender behaviors (similar to those of Kraig) began in early childhood (Green, 1967, 1968; Money, 1968; Money and Brennan, 1968; Money and Primrose, 1968). Two-thirds of Walinder's (1967) cases of adult transsexuals consciously felt "...as though they belonged to the opposite sex..." prior to the age of five years. Cross-gender behaviors have been reported in children studied between the ages of 1½ and 6 years (Hertz, Tillinger, and Westman, 1961; Green, 1968; Greenson, 1968; Litin, Griffin and Johnson, 1956; Zuger, 1966). It appears to be the case, in boys at least, that substantial deviation from appropriate sex-role behavior at the age of five (such as preference for the dress, toys, peer-play, and mannerisms of the opposite-sexed child) leads to substantial gender problems in adulthood, in the majority of cases.

Apparently, an individual's gender orientation and sex-role become well established psychologically at a very early age. Support for this conclusion follows from several areas of investigation, diverse in terms of subject population, including research on rhesus monkeys (Harlow, 1965), on human infants (Goldberg and Lewis, 1969), on normal children between the ages of three and five years (Brown, 1957;

Delucia, 1963; Fagot and Patterson, 1969; Hartup and Zook, 1960; Kagan and Moss, 1962; Pintler, Phillips and Sears, 1946; Rabban, 1950), on hermaphrodites (Hampson, 1955, 1965; Money, 1957; Money, Hampson and Hampson, 1955a, 1955b), and on adult transsexuals and transvestites (Green, 1967, 1968; Money, 1968; Money and Brennan, 1968; Money and Primrose, 1968; Walinder, 1967). Some research suggests a possible genetic or organic basis for behavioral differences between the sexes (e.g., Morgan, 1968, in animal studies; and Casey, Street, Segall and Blank, 1968, in studies of human homosexuality). However, most research suggests that a person's gender identity appears most highly correlated with an environmental etiology. For example, the gender role and orientation of hermaphrodites was found to be correlated with the kind of learning experiences present in early life, and not correlated with any one of the five variables of physical sex (Hampson, 1955, 1965; Money, Hampson and Hampson, 1955a, 1955b; Money, 1957). Similarly, Pauly (1965) concluded from a study of 100 cases of transsexualism collected from the medical literature that current evidence does not substantiate claims of genetic or organic etiology. Walinder (1969) recently came to the same conclusion in his research on transsexuals. While an exclusive environmental etiology of cross-gender behavior in humans has not been conclusively demonstrated, the literature suggests that constitutional variables play a minor role, if any. Beach (1965) has noted that studies

of mammals indicate a lessening hormonal control of sexual behavior and increased control by the cerebral cortex, as one ascends the mammalian scale. Ascending the phylogenetic scale, learning becomes increasingly more important than genetic factors in the development of sexual behaviors in general (cf., Harlow, 1962). A social learning interpretation (e.g., Bandura and Walters, 1963; Bandura, 1969) of the etiology of cross-gender behavior appears to be consistent with the findings of a number of investigations (e.g., Bentler, 1968; Bond and Hutchinson, 1964; Conn, 1954; Cooper, 1963; Green, 1967; Johnson, 1953; Litin, Griffin and Johnson, 1956; Lukianowicz, 1959; McGuire, Carlisle and Young, 1965; Money and Primrose, 1968; Stoller, 1967; Whitener and Nikelly, 1966).

Current understanding is incomplete regarding the environmental conditions under which normalization of sex-role behavior could be accomplished. In reviews of the literature, Benjamin (1969), Baker (1969), Green (1969), and Pauly (1969) conclude that there are no reported cases in which psychotherapy has been successful in helping transsexuals accept the gender identity which is consistent with their anatomy; it is reported that hypnosis, chemotherapy, electroconvulsive therapy, and behavioral therapies (including aversive conditioning and systematic desensitization) have been totally unsuccessful. The extremely poor prognosis for adult transsexuals is unfortunate since the condition is the source of deep conflict and discontentment (cf., Money, 1968; Pauly,

1965, 1969; Walinder, 1967). Even children diagnosed as having cross-gender problems typically experience severe developmental problems and peer rejection (cf., Stoller, 1970).

The lack of positive results from psychotherapy for the adult transsexual calls for study to discover effective techniques for therapeutic intervention at an early developmental stage. Given that gender-related behaviors are established early in life, and are probably more susceptible to therapeutic intervention at such a time, it seems logical to attempt to study and treat cross-gender problems in early childhood. Unfortunately, however, the literature does not specify what environmental manipulations might be necessary for a positive therapeutic outcome, even in cases of childhood gender behavior deviance. Therefore, we sought to demonstrate that the child's gender behaviors could be modified in a therapeutic direction by social learning contingencies.

Using behavior therapy techniques, we sought to demonstrate reinforcement control over cross-gender behaviors in a male child. While we found no unequivocal reason in the literature to conclude that disorders of gender identity are solely biologically determined, we recognized the possibility of constitutional determinants. A behavioral treatment approach, nevertheless, appeared resonable since behavior therapy can be successfully applied even in cases where the

therapist is ignorant of the etiology of the deviant behavior. It seemed reasonable to expect, however, that if strong biological determinants existed, the behavior change might be more difficult to bring about, or require sustained effort for its maintenance over time.

We determined baserates for feminine behaviors in the clinic and home simultaneously. Treatment was first introduced in the clinic, while baseline observational measures of Kraig's behavior continued in the home. This provided data appropriate for analysis by the type of multiple baseline design which employs measures of the same behavior in more than one setting (cf., Baer et al., 1968; Hall et al., 1970).

We will discuss the treatment of Kraig in four steps: (1) observational measures in the clinic; (2) observational measures in the home; (3) treatment in the clinic; and (4) treatment in the home.

Observational Measures in the Clinic

Materials. Two sets of stimuli were selected--one "sex-typed" as boys' toys, and the other "sex-typed" as girls' toys. We know that these stimuli are genuinely related to important differences in play by normal boys and girls, on the basis of (a) the reports of toy-preferences of normal children, aged three to eleven years, in published research, and (b) our own pilot work. For each pilot S, we calculated

the percentage of feminine play out of the total amount of appropriate play (masculine + feminine) on the two toy tables described below. A highly significant difference was found between the mean percentage of feminine play for normal boys and the mean for girls (one-tailed t-Test, d.f. = 12, $p << .001$). The percentage of feminine play by girls ranged from 74% to 93%, with a mean of 82%. The percentage of feminine play by normal boys ranged from 0% to 27%, with a mean of 11%. On the basis of both the literature and our own pilot work, then, we are convinced that the toys selected for this study highly discriminate between the toy-preferences of normal boys and girls.

Two child-sized tables (2 ft. high; 5 X $2\frac{1}{2}$ ft. top surface) were placed in the experimental play-room (12 X $14\frac{1}{2}$ ft.). "Boy toys" were placed on one end of each table, and "girl toys" were placed on the other end. The quantity and quality of the boy and girl toys were roughly equated.

One of the tables (Dress-Up Table) had clothing and grooming toys on it. On one side were girls' cosmetic articles and girls' apparel, consisting of a woman's wig, a small pair of play high-heeled shoes, a front-buttoned long-sleeve dress (child's size), a play cosmetic set (lipstick and manicure items), and a set of jewelry consisting of bracelets, necklaces, rings, and earrings. These toys had been sex-typed as feminine by several

investigators (Brown, 1956; Lefkowitz, 1962; Rabban, 1950; Sutton-Smith, Rosenberg & Morgan, 1963). On the other side of the Dress-Up Table were boys' apparel, namely a plastic football helmet, a sea captain's hat, an army helmet, an army "fatigue" shirt with stripes and other military decorations, an army belt with hatchet holder and canteen holder, and a battery-operated play electric razor. This second set of toys had been sex-typed as masculine by several studies (Brown, 1956; Lefkowitz, 1962).

The second table (Affect Table) was also divided in two parts. On one side were placed girl toys associated with maternal nurturance, namely a baby doll in a three-foot crib with sliding side, a baby bottle, baby powder, a "Barbie" doll with two sets of dresses, shoes, hat and miniature clothes line. Many investigators have sex-typed these toys as feminine (Brown, 1956; Fagot & Patterson, 1969; Hartley & Hardesty, 1964; Rabban, 1950; Sutton-Smith et al., 1963; Vance & McCall, 1934; Ward, 1963). On the other side were placed articles associated with masculine aggression, consisting of two dart guns with darts, a small target, a rubber knife, plastic handcuffs, a set of plastic cowboys and Indians (42 pieces, 2 inches tall each). This second set of toys had been sex-typed as masculine (Brown, 1956; Hartley & Hardesty, 1964; Rabban, 1950; Rosenberg & Sutton-Smith, 1959, 1964; Sutton-Smith et al., 1963; Walker, 1964). This toy table is abbreviated as "Affect

Table" since the toys provide the opportunity for sex-typed affect expression--either maternal nurturance or masculine aggression.

The child's play and verbal behavior with these toys was recorded from behind a "one-way mirror" on a General Electric Tri-Pac closed-circuit television monitoring system. Simultaneously, the child's play and verbal behavior was recorded from behind the "one-way mirror" by two observers (Os) on a Push-Button Response Panel with two sets of keys for independent behavior rating. The Response Panel was wired to the Commercial Controls Corporation Motorized Tape-Punch, Model 2, which records key positions every one-second, on a Hewlett-Packard computer punch tape.

In addition to the data on masculine and feminine play behavior, the baseline for the study included measures of masculine and feminine content in speech. Kraig's verbal behavior was tape-recorded during the play sessions in the clinic. His verbal behavior was then scored from the tapes by Os who pressed the appropriate button key of the Button-Response-Panel, for the duration of each verbal phrase, depending on its content. Each verbal phrase was judged to fall into one of three mutually-exclusive content categories--feminine, masculine, or neutral. Table 1

Insert Table 1 about here

TABLE 1

Examples of Feminine, Masculine, and Neutral Words for Categorical Scoring of Verbal Phrases.

Feminine Category

1. Feminine objects:
   Girls' toys; dolls; jewelry items; hairstyles; cosmetics; dresses; perfume.

2. Feminine persons:
   Queens; actresses; mother; sister; nurses; girls; women.

3. Feminine activities:
   Sewing; caring for babies; applying makeup; putting on a dress; playing female role.

Masculine Category

1. Masculine objects:
   Boys' toys; guns; building tools; cars; baseball; football shoes.

2. Masculine persons:
   Kings; actors; father; brother; soldiers; policemen; firemen; boyscouts; boys; men.

3. Masculine activities:
   Camping; playing sports; piloting an airplane; driving a truck; hunting deer.

Neutral Category

1. Neutral objects:
   Plants; television; puzzles; telephone; camera; crayons; raincoat; cat; dog; food.

2. Neutral persons:
   A crowd; a burglar; a teacher; a swimmer; a baby. (Whenever the gender of the individual is left unspecified).

3. Neutral activities:
   Watching television; drawing pictures; bicycle riding; eating; going to school.

presents examples of words which identified each phrase as belonging either to the feminine, masculine, or neutral category. Phrases with ambiguous content were scored as neutral. O was instructed to press a button switch for the duration of each feminine verbal phrase and phrases with feminine voice inflection. Another button was pushed for the duration of each masculine verbal phrase, and a third button for neutral phrases. For each session, the per cent feminine speech and per cent masculine speech was calculated with reference to the total number of seconds of verbal behavior (total = feminine + masculine + neutral).

Procedure. Each time S came to the laboratory for a session, he was given the opportunity to play on the Dress-Up Table for one five-minute play period, and on the Affect Table for one five-minute play period. Each play period was separated from the next by a two-minute "break." The order in which the two tables were presented was randomized for each session. Each session was from two to four days apart, on the average. By obtaining independent observational measures of masculine play and feminine play on the Dress-Up Table, masculine and feminine play on the Affect Table, a multiple baseline was obtained over five or six

sessions.

The experimenter (E) led S into the experimental (play) room and gave these instructions:

> "When I leave the room, you may play with any of the toys on this table (pointing). Even though you will not see me, I can see you play; so, I will know if you are playing with this table or a wrong table. So remember, choose toys to play with from this table only."

(The child was restricted by instruction to play with only one of the two toy tables present in the room for two reasons. First, it was found that pilot normal Ss frequently mixed toys from the two tables in their play, complicating the scoring. If S was restricted to one toy table at a time, he had an equal opportunity play with each set of toys, and the behavior is relatively easy to score. Secondly, the presence of the other toy table provided a "reason" for the E to be monitoring Ss behavior as given in the instruction. It was judged to be undesirable to attempt to deceive S regarding the possibility that he would be observed, since E's relationship with S might be damaged if S discovered the deception.) S was left alone in the room for a five-minute period, after which E reentered the room and said:

> "Please put all the toys back on the table and come with me, now."

E ignored Ss' questions and other verbalizations unrelated to the clarification of instructions.

After a stable baseline had been obtained, a non-interacting adult (a "probe" condition) was placed in the room while the child played on one of the tables. On the same day, the child played alone on the other table. The adult was instructed to passively watch S play, and to defer any questions S might ask until after the play period. Immediately prior to leading S into the room for this condition, E instructed S:

> "This time your daddy (alternatively, mommy, or a kind stranger) will be in the room to watch you play. I told him/her not to play with the toys, but just to watch you play by yourself. Come with me into the playroom."

In all experimental conditions, O recorded appropriate play with masculine toys by pressing key #1 for the duration that S was in physical contact with a masculine toy, and used the toy for its intended purpose; similarly, key #2 was pressed for the duration of appropriate play with feminine objects. These two response categories were defined to be mutually exclusive; Os were instructed not to score (1) inappropriate play (e.g., cross-gender role use of a same-gender toy object, such as using the army belt for a bonnet), (2) feminine gestures, posturing, or gait, or (3) play in which S was in physical contact with a toy

from both classes of toys. This kind of objective behavioral observation in a free play setting had been developed in detail by Lovaas, Freitag, Gold, and Kassorla (1965).

In order to obtain measures of observer reliability across several Os, three 20-second time samples were recorded on videotape for each five-minute play period. A time sample was taken from each of the three successive 100-second intervals, according to a schedule with was determined by a random numbers table. The entire session was also recorded on audio tape, for complete transcription and scoring of verbal behavior.

Observer reliability. The reliability of the dependent measures was determined by two procedures:

(1) Observer reliability was checked periodically throughout the experiment by giving a second O an independent set of response panel keys during the session. The recordings of both Os were scored parallel on the same computer punch tape. By this procedure, observer reliability data was collected and correlation coefficients were calculated for masculine behaviors between O_1 and O_2 and between O_2 and O_3 for ten-minute sessions divided into one-minute segments; similarly, reliability coefficients were calculated for observations of feminine behavior between O_1 and O_2 and between O_2 and O_3.

(2) After all data had been collected in the

laboratory setting, three naive observers (O_4, O_5, and O_6) scored randomly selected video-taped time samples for masculine and feminine behaviors. These Os were completely unaware of the research purposes, experimental conditions, or diagnoses of Ss (whether normal or patient). Correlation coefficients between each "naive" O and "informed" O_3 were calculated separately for each behavior (masculine or feminine) on each table (Dress-Up and Affect).

Observational Measures in the Home

A daily behavior checklist was individually developed for Kraig to obtain reliable observational measures of his feminine behavior at home. The checklist form consisted of descriptions of frequently occurring feminine behaviors. The checklist items were selected on the basis of (a) psychiatric referral information, (b) data from the Rekers Behavior Checklist for Childhood Gender Problems (see Appendix) which was completed by Kraig's mother, (c) interviews with the parents, and (d) observations of the child's

behavior made by the investigators in the clinic and home settings.

Specifically, the descriptions of feminine behaviors on the daily behavior checklist for Kraig were (a) "plays with girls," (b) "plays with dolls," (c) "feminine gestures," and (d) "female role play." Kraig's mother was instructed to observe and record her son's behavior for ten minutes at four specific times daily, according to a schedule mutually arranged with E. The recording was accomplished by placing a check after the description of each behavior which was observed during that time period. Observer reliability for this time-sampling procedure was checked periodically throughout the study by home visits by research assistants. Very frequent reliability checks of this kind were made during the first three weeks of the procedure.

Treatment in the Clinic

Materials. A new set of toys was gathered for the therapy sessions, and these toys are identified by the abbreviation "Therapy Table." Therapy was conducted in the playroom with the toys on the Therapy Table, and generalization of treatment effects was assessed by introducing "generalization sessions" which involved play with toys on the Dress-Up and Affect Tables. The toys on the Dress-Up and Affect Tables will be referred to

as the "generalization toys."

During therapy sessions, the mother served as the therapist in a play situation with the following sex-typed toys. The toys on the Therapy Table most closely resembled those used by Rabban (1950) and the replication study by Sears, Rau, and Alpert (1965). The masculine-type toys were the following: (1) a plastic toy submachine gun, with moving trigger, but silent; (2) a highway road scraper, with adjustable blade; (3) a plastic race-car with friction motor; (4) a plastic tugboat with moving helm and search light; (5) three miniature plastic soldiers; (6) a set of five small plastic airplanes; and (7) a plastic dump-truck with moving dump mechanism. The feminine-type toys were the following: (1) a baby doll with feminine clothes and miniature nursing bottle; (2) a doll crib with moving side; (3) a doll Bathinette; (4) two purses, one child size and one doll size; (5) a doll Baby-tenda (feeding chair); (6) a set of plastic toy tea dishes: two cups, two saucers, silverware, and a teapot; and (7) a wicker doll buggy with movable canopy. The crib, Bathinette, Baby-tenda, and buggy all had plain dolls in them. The following criteria for uniform attractiveness were met by all the above toys: (1) all had at least one moving part; and (2) none had more than two distinct possible types of manipulation.

In the play room, the child was in visual and reaching range of both masculine and feminine toys, while seated

next to his mother. The Therapy Table was placed two feet in front of the one-way mirror in the clinic play room. A child-sized and an adult-sized chair were placed facing each other on the opposite side of the table. Both persons face the mirror so as to allow clear visability to communicate with the mother without the child's knowledge. The mother wore a set of earphones which allowed E to communicate to her.

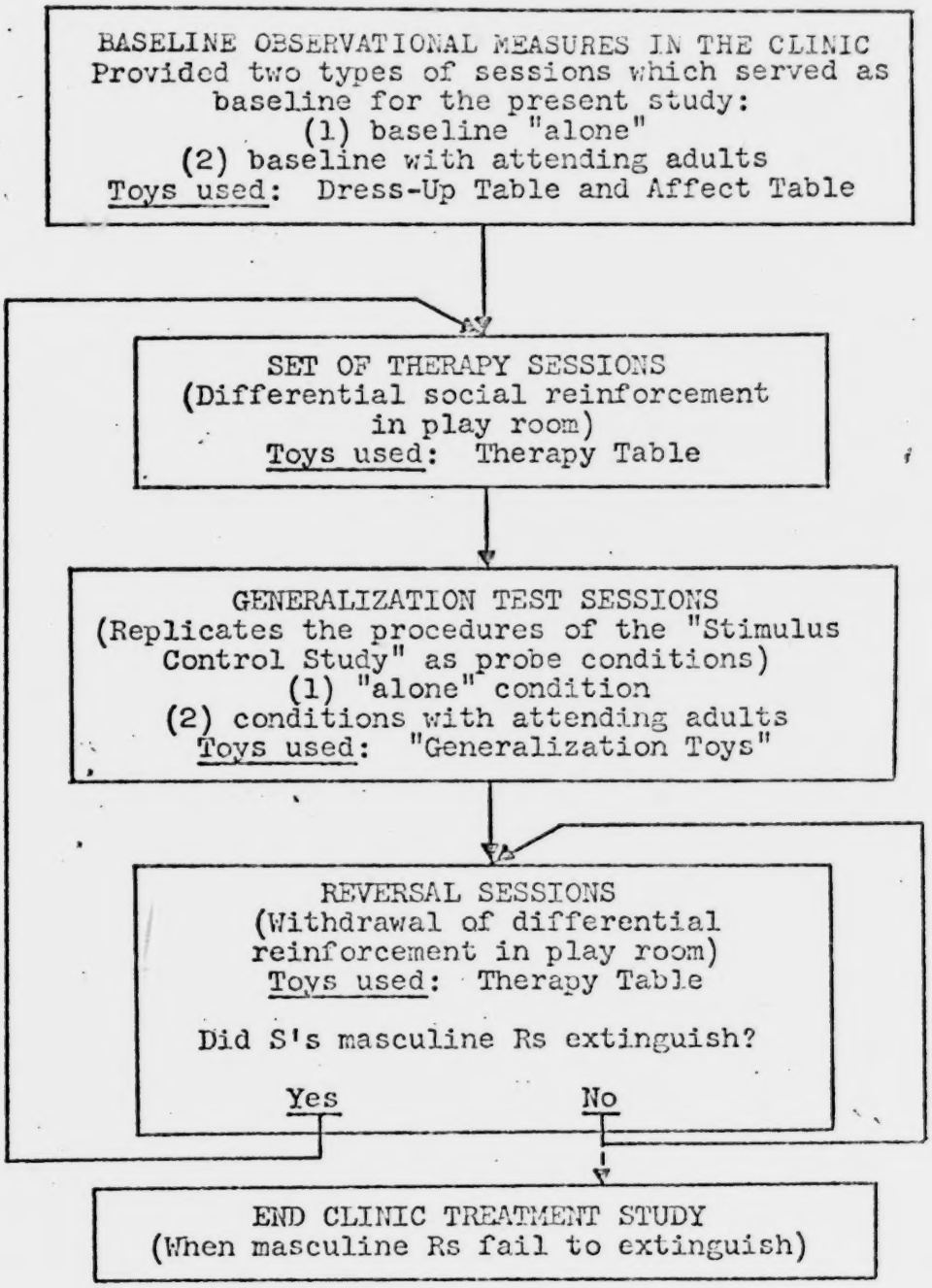
The child's behavior was recorded in the identical manner described above in the section on "Observational Measures in the Clinic," using the same recording equipment.

Procedure. The procedure included several types of sessions: (1) baseline sessions, in which the child played in alone and adult-attending conditions, (2) therapy sessions, in which the mother differentially reinforced the child's gender-related behaviors, (3) generalization sessions, in which the baseline conditions were replicated to assess the generality of the treatment effect, and (4) reversal sessions, in which the reinforcement contingencies of the therapy sessions were withdrawn. We will explain each type of session in detail and explain the ordering of the sessions with reference to diagram in Table 2.

Insert Table 2 about here

TABLE 2

Schematic Diagram of the Ordering of Sessions in the Clinic Study of Reinforcement Control


BASELINE OBSERVATIONAL MEASURES IN THE CLINIC
Provided two types of sessions which served as baseline for the present study:
(1) baseline "alone"
(2) baseline with attending adults
Toys used: Dress-Up Table and Affect Table
SET OF THERAPY SESSIONS
(Differential social reinforcement in play room)
Toys used: Therapy Table
GENERALIZATION TEST SESSIONS
(Replicates the procedures of the "Stimulus Control Study" as probe conditions)
(1) "alone" condition
(2) conditions with attending adults
Toys used: "Generalization Toys"
REVERSAL SESSIONS
(Withdrawal of differential reinforcement in play room)
Toys used: Therapy Table
Did S's masculine Rs extinguish?
Yes
No
END CLINIC TREATMENT STUDY
(When masculine Rs fail to extinguish)

Baseline sessions. Prior to the therapy sessions we had obtained baseline data on the child's verbal and play behavior on the Dress-Up Table and Affect Table. These measures were described above in the section "Observational Measures in the Clinic." This provided two types of baseline sessions: (1) alone conditions, and (2) adult attending conditions.

Therapy sessions. Since the child's behavior was predominantly feminine in both the "alone" and "mother attending" baseline sessions, we treated the child in an attempt to extinguish feminine behavior and to shape masculine behavior. Each therapy session was ten minutes in length, during which time the following conditions were in effect. The mother was instructed to sit on the large chair wearing her earphones and with a large book in her lap. She was told to selectively attend to masculine verbal and play behavior by smiling to her boy and complimenting him on his play, and to ignore feminine behavior by picking up the book to "read." She was told that more specific instructions would be delivered over the earphones, to enable her to carry out these general instructions effectively.

E led the child into the room and seated him in the child's chair so that he faced his mother. The child was then instructed:

"You may play with any of the toys you like

on the table (pointing), until I come back. You may talk with your mommy, too, if you want to. I'll be back in ten minutes."

After ten minutes, E re-entered the room and said:

"Please put all the toys back on the table now, and come with me, Kraig."

During the session, the mother was shaped to extinguish feminine behavior (verbal and play) by instructions over the earphones such as, "Stop talking to him now," "Pick up the book and read," "Ignore him now," "Look away from him." Immediately after the mother's correct response, E verbally reinforced her, e.g., "Good," "Great, that's what we want," "That's right," "Excellent!" Similarly, if S picked up a masculine toy when the mother was not watching, E instructed her, "Quick, look at him now," or "Talk to him now."

Initially, a large number of prompting instructions were given, in conjunction with a large amount of E's approval. After four sessions, the prompts were faded out, but the reinforcement schedule was continuous for several more sessions before it was thinned. When the child began tantrum or other uncooperative behaviors (he typically did when his mother ignored him), E was particularly supportive of the mother.

Generalization sessions. After six consecutive

training sessions, we ran two types of generalization sessions. Both of these test sessions replicated specifically the procedure used in the baseline sessions in which the child played in alone and adult-attending conditions. We have called these sessions "generalization sessions" since the child played with the toys on the Dress-Up Table and Affect Table, which were different from the toys used for treatment. This test provided a measure of the extent to which the treatment also changed the child's behavior with similar, but different toys.

Reversal sessions. After the generalization sessions, the child and the mother were placed back into the therapy environment, but the reinforcement contingency was removed. The mother was told to attend to all of her son's behavior indiscriminatively. This allowed us to determine if the changes brought about by treatment were permanent or if they depended on continuing reinforcement. If the masculine behavior failed to extinguish after four of these sessions, we terminated this treatment phase, being satisfied that the behavior change was reasonably durable. When the child's masculine behavior did extinguish, we retrained the child by reintroducing the therapy sessions (see Table 2). After retraining, generalization sessions and reversal sessions followed again.

Results. Os were reliable in their recordings. The correlation coefficients between "informed" O_3 and "naive" O_7 ranged from 0.93 to 0.99, with a median of 0.97, indicating a high degree of agreement between Os.

In general, the treatment results on Kraig may be summarized as follows. Kraig's sex-typed behaviors were strongly controlled by his mother's attention. During the pre-treatment baseline sessions, Kraig's play and verbalizations were consistently feminine; masculine behavior rarely occurred whether Kraig was alone, with his mother, or with a male stranger. Each time the therapy sessions were introduced, the feminine behavior decreased and masculine behavior increased. And when the treatment was discontinued, Kraig quickly reverted back to feminine play. With the continuation of treatment, the change in Kraig's behavior became more permanent.

The detailed results are presented in Figure 1, which

Insert Figure 1 about here

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shows sex-typed play behavior on the upper graph, and the concurrent sex-typed verbal behavior on the lower graph for each session. The results will be presented in groups of sessions, by experimental condition. The ordering of experimental conditions followed the diagram of Table 3.

Baseline: Sessions 1 - 16. In all types of baseline

sessions, Kraig played almost exclusively feminine. Over these sessions, Kraig's verbal behavior was either predominantly feminine or did not occur. The baseline consisted of three types of conditions using the Dress-Up Table and Affect Table: (1) alone condition, (2) play with mother present, and (3) play with male stranger present. The data for the two tables is averaged together for each session (1 - 16).

Therapy: Sessions 17 - 22. When the mother introduced the differential reinforcement, Kraig's feminine play decreased and masculine play increased. The finding that feminine play decreased substantially already within the first therapy session suggests a change of performance rather than the acquisition of a new operant.

Generalization Test: Sessions 23 - 25. We ran two kinds of generalization test sessions with a new set of toys: (a) play alone with the generalization toys, and (b) play with mother present with the generalization toys. We found that the treatment effect did generalize in the mother's presence, even though the toys required a different set of behaviors. Kraig's masculine behaviors in session 25 contrasted to the pre-treatment baseline (sessions 7 and 11) where he played feminine. There was no generalization of treatment effect, however, when Kraig played with the generalization toys alone; the data show

that his play was predominantly feminine when alone. This difference between Kraig's play alone and in his mother's presence may be interpreted in terms of discriminative stimulus properties acquired by the mother in the therapy sessions.

Reversal: Sessions 26 & 27. We placed Kraig and his mother back into the room with the Therapy Table toys and withdrew the therapeutic contingency. This tested whether the acquired S^D properties of the mother would be maintained in the absence of the differential reinforcement. In this condition, the mother was instructed to attend to all of her son's behaviors indiscriminatively. By session 27, Kraig's masculine play and verbal behavior had extinguished; feminine behavior rose to the baseline level.

Second Set of Therapy Sessions: Sessions 28 - 32. When the reinforcement contingency was again introduced by the mother, Kraig resumed masculine behavior, both play and verbal. This finding provided additional evidence for the effect of the treatment variable. The quick reversal of Kraig's sex-typed behavior again suggested that he was responding to an S^D which signaled the change of reinforcing consequences.

Second set of Generalization Tests: Sessions 33 - 36. After the second set of therapy sessions, we tested

for generalization to the play alone condition. The findings in the second set of generalization tests exactly replicated the findings in the first set (sessions 23 - 25). Specifically, Kraig played totally masculine on the generalization toys in his mother's presence, but he played exclusively feminine with those toys when alone. Again, the treatment effect was found to be specific to the mother's presence. This indicated the situational-specificity of the treatment effect.

After obtaining this evidence that the treatment effect had generalized to play on a different set of toys in the mother's presence, we tested for generalization of treatment effects to the presence of a male stranger. In the baseline (session 13), Kraig's behavior (both play and verbal) was exclusively feminine. However, when a male stranger was introduced as a probe with the generalization toys (session 36), Kraig played exclusively masculine. This indicated generalization of the treatment effect across two stimulus variables: (a) to a different set of toys than used in therapy, and (b) to a different adult figure than the therapist.

Second Set of Reversal Sessions: Sessions 37 - 39. During the second set of reversal sessions, Kraig's masculine behavior extinguished with the withdrawal of the reinforcement contingencies, and his feminine behavior

increased. This replicated the first reversal sessions (26 and 27). In the absence of continued differential reinforcement, Kraig's behavior returned to the baseline level of feminine play and verbalizations.

Third Set of Therapy Sessions: Sessions 40 - 44. This third set of therapy sessions resulted in a return to predominantly masculine behavior. Once again, the quick return to masculine behavior suggested S^D control over Kraig's sex-typed behavior.

Third Set of Generalization Tests: Sessions 45 - 48. After the third set of therapy sessions, we introduced generalization tests again. After previous treatment sessions, we had found generalization of treatment effects to play in the presence of the mother and male stranger, but not in the alone condition. Replicating previous generalization tests, Kraig's behavior was exclusively masculine in the presence of the mother and male stranger (sessions 47 & 48 respectively). Unlike previous generalization tests, however, Kraig now played totally masculine when alone with the generalization toys (session 45). However, his play returned to feminine in session 46. This suggested some weak generalization of treatment effects to the alone condition, which had not been evidenced after one and two sets of therapy sessions.

Third Set of Reversal Sessions: Sessions 49 - 55.

Kraig had had three sets of treatment sessions to this point. Now, when his mother withdrew the differential reinforcement contingency, the appropriate masculine behavior persisted, being evidently resistent to extinction. At this point, the clinic treatment was terminated, since we had sufficient evidence to conclude that (a) the changes in Kraig's sex-typed behavior were a function of the reinforcement contingency, and (b) the behavior change had some permanence after removing treatment conditions.

Final Generalization Test: Sessions 56 - 60.

Through the course of treatment, we had obtained several replications of the generalization effects that occurred in the presence of the mother and male stranger. The data clearly indicated strong generalization of treatment effects to play with the generalization toys in the presence of these adult figures; replications were obtained over time. In contrast, we had only weak evidence for generalization to the play alone condition. In the first set of generalization test sessions, Kraig played 72% feminine (sessions 23 and 24). In the second set of generalization test sessions, Kraig played 100% feminine. The most masculine behavior occurred in the third set of generalization test sessions where Kraig played 100% masculine in one session (45) but 82% feminine in the other (46). This

could possibly represent a trend towards increasing generalization to the alone condition as a function of additional sets of therapy sessions. Further replication, however, would be necessary to make such a claim. Therefore, we had Kraig play alone again with the generalization toys to replicate the earlier finding of masculine play. Our unexpected finding was that Kraig played exclusively masculine for these sessions (56 through 60). This suggested at least moderate generalization of the treatment effect across behaviors to the play alone with generalization toys. A partial explanation of this finding may be derived from Kraig's verbal statement at the beginning of session 56; upon entering the room, Kraig said outloud, "I wonder which toys I will play with. Oh, these are girls' toys here, I don't want to play with them." Than Kraig commenced to play with the masculine toys. This spontaneous verbal labeling may, in part, account for Kraig's masculine play from that time on.

In general, the results of the clinic treatment for Case 1 may be summarized as follows. During the pretreatment baseline sessions, Kraig's play and verbalizations were consistently feminine; masculine behavior rarely occurred whether Kraig was alone, with his mother, or with a male stranger. Each time the therapy was introduced, the feminine behavior sharply decreased and masculine behavior increased. When the contingencies were withdrawn early in

the treatment, however, Kraig reverted back to predominantly feminine behavior. During the course of treatment, Kraig's mother and a male stranger became discriminative for masculine play on a set of generalization toys. Finally, after three sets of therapy sessions, Kraig's acquired masculine behavior appeared to be resistant to extinction.

We are confident that the changes in sex-typed behavior were a function of our treatment variable, since the experimental procedure followed the ABABAB reversal, intra-subject replication design. In this design, the "A" represented the baseline and reversal conditions in which there was no differential reinforcement contingency. And the "B" condition represented the therapy sessions where masculine play and verbalizations were positively reinforced and feminine play and verbalizations were extinguished. During the "A" conditions, Kraig's behavior was predominantly feminine, and during the "B" conditions, his behavior was predominantly masculine. Therefore, it is concluded that Kraig's sex-typed behavior was a function of the differential reinforcement contingency which constituted the treatment.

Treatment in the Home

Prior to and during the treatment in the clinic, Kraig's feminine behaviors were recorded in the home with

the daily behavior checklist. This time-sampling procedure provided a baseline before clinic treatment and provided a means to test for generalization of treatment effect from the clinic to home. These measures taken in Kraig's home indicated that the clinic treatment effect did not generalize to the home even though the mother was the therapist in the clinic. The treatment effect appeared to be setting-specific. Therefore, we considered it to be in the best interest of the patient to extend the treatment to the home where Kraig's cross-gender behavior contributed to his maladjustment within his family.

A therapeutic secondary reinforcement system was developed for Kraig in the home environment; Kraig's mother mediated the token economy program. (Previous studies--e.g., Zeilberger, Sampen, & Sloan, 1968--have shown that child problem behaviors can be modified in the home by training the mother to be the behavior therapist for her child.) Assessment of the effects of the reinforcement contingencies was accomplished by following a multiple baseline, intrasubject replication design. Dependent measures were obtained by the time-sampling technique involving the daily behavior checklists completed by the mother. (Hall, Axelrod, Tyler, Grief, Jones, and Robertson, 1972, have shown that the parent can reliably serve as both the observer and therapist in home programs designed to modify child behavior problems).

Procedure. Kraig's mother was trained to mediate the token reinforcement system for her son at home. Both parents were asked to read Patterson and Gullion (1968), a programmed booklet for laymen explaining the application of reinforcement principles to childhood behavior problems. More detailed instruction on the administration of a home token system was provided by the investigator. To assure that our instructions were accurately carried out by the parents, a research assistant was sent to the home at least three times weekly to observe the parent-child interaction, and to answer questions regarding the practical "day-to-day" operation of the token system. In addition, both Dr. Ivar Lovaas and Dr. Rekers assured the parents that they would be "on-call" at all times if any question arose concerning Kraig's home treatment.

In consultation with the mother, appropriate "back-up" reinforcers (cf., Sherman and Baer, 1969) were selected according to the child's unique preferences for certain candies and rewarding activities (e.g., T.V. time). Red and blue standard poker chips were used as "tokens." The blue tokens served as secondary positive reinforcers (S^{r+}) while the red tokens were secondary negative reinforcers (S^{r-}). The blue tokens could be directly exchanged by the child for the "back-up reinforcers" according to a "price-list" set by the mother (e.g., five blue tokens were required for a candy bar). The red tokens were discrimina-

tive for a negatively reinforcing event, consisting of (a) a response-cost condition (i.e., red tokens were subtracted from accumulated blue tokens), (b) a time-out procedure (e.g., sitting in a corner, being deprived of T.V. time), or (c) physical punishment by spanking from the father.

Before introducing the token economy system to feminine behaviors, it was applied to non-gender behaviors in the home. This procedure had three purposes: (a) to test the mother's capability to consistently manage the contingencies, (b) to establish a clear discrimination between S^{r+} and S^{r-} contingencies for the child, and (c) to determine the strength of the S^{r-} contingency necessary to effectively suppress an undesired behavior in this child.

The token system on non-gender behaviors involved both S^{r+} and S^{r-} contingencies. Blue tokens were awarded for helpful, desired behaviors (e.g., brushing teeth, washing hands before eating, eating all food on plate, chores). Red tokens were given for tantrumous and disobedient behaviors (e.g., slamming doors, "cursing" at mother, tracking dirt on carpet, disturbing baby sister, and breaking household objects). The mother was instructed to verbalize the contingencies to her son and to make careful daily records of the occurrence of both the desired behaviors and the disobedient behaviors, on special mimeographed forms we provided. Reliability of the mother's

records was checked by comparing her records to those of a research assistant who made two visits weekly to the home.

After the token reinforcement system had been successfully applied to the child's non-gender related behaviors in the home, it was extended to gender behaviors. The mother introduced a negative reinforcement contingency (S^{r-}) for one feminine behavior for a period of weeks. The mother was told to verbalize the new contingency and then apply it on a continuous schedule. The S^{r+} and S^{r-} contingencies on non-gender related behaviors were maintained. After the first feminine behavior had been suppressed for several weeks, the S^{r-} contingency was introduced to a second feminine behavior in addition to the first. Similarly, the S^{r-} contingency was extended to a third feminine behavior after the second had been suppressed. These successive interventions permitted a replication of the S^{r-} contingency across behaviors in a multiple baseline design.

Results. A high degree of observer reliability was obtained for the dependent measure involving the daily behavior checklist. To determine the level of observer reliability, a comparison was made of the data obtained from independent time-sampled recordings on the home behavior checklist made by Kraig's mother and a research assistant (RA). The percentage of agreement on the occurrence of checklist behaviors was calculated weekly between

the mother and RA. (Agreement on the non-occurrence of checklist behaviors was not included in the calculation, in order to obtain a conservative estimate that would not be artificially inflated in cases where the behaviors occurred at extremely low frequencies). The percentage of agreement between Kraig's mother and the RA ranged from 87% to 100%, with a median value of 94%.

Figure 2 indicates the baseline rate of feminine

Insert Figure 2 about here

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behaviors at home for four weeks before any therapy. During this baseline period, "play with girls" and "feminine gestures" occurred at a relatively high frequency (between 18 and 70 per cent), while "play with dolls" and taking "female role in play" occurred at a more moderate frequency (between 0 to 12 per cent). These four activities were the most pronounced feminine behaviors that Kraig displayed.

Beginning with week number five, the token reinforcement system was applied to non-gender behaviors. Beginning with week number seven, the clinic treatment for feminine behaviors was applied. Both of these interventions continued through the eleventh week. Figure 2 indicated that no systematic change in feminine behavior at home could be attributed to either one of these interventions.

The token system did result in an increase in Kraig's helpful, desired behaviors. But his tantrumous and

disobedient behaviors were not significantly suppressed with the application of red tokens (S^{r-}) which were backed up by the response-cost condition, the time-out procedure, or both. The disobedient behaviors did sharply decrease, however, when the red tokens were backed up by spanking. Kraig was told that he would get one "swat" from his father for each red token he collected. After receiving two swats in this manner, Kraig carefully avoided receiving the red tokens from that time on. Over the thirty-six weeks during which this contingency was in effect, Kraig received very few swats, since he successfully avoided the undesired behaviors.

The token system was extended to cross-gender behaviors in the twelfth week with the introduction of red tokens (S^{r-}) for Kraig's "play with dolls." As indicated on Figure 2, "play with dolls" decreased completely and remained at the zero rate every week after the introduction of this contingency. However, "feminine gestures" and "play with girls" continued at a rate comparable to the baseline weeks. "Female role play" decreased to zero at week 10, two weeks prior to the introduction of the S^{r-} contingency for "play with dolls." It is unclear why "female role play" ceased. It is possible that "female role play" falls into the same response class as "play with dolls" for Kraig, causing it to remain suppressed after week 12; however, the data is inconclusive and no firm

conclusion may be drawn regarding the variable controlling "female role play."

At week 21, red tokens (S^{r-}) were introduced for "feminine gestures." The frequency of feminine gestures under this contingency dropped to zero in all subsequent weeks, with the sole exception of week 22 where gestures occurred around 10% of the observation periods. "Plays with girls" was unaffected by this added S^{r-} contingency. Comparing this suppression of feminine gestures after week 21 with the baseline weeks 1 through 20 provides a replication of the effect of the S^{r-} contingency across behaviors.

The final S^{r-} intervention began at the 37th week with the introduction of red tokens for "play with girls." Kraig responded quickly to the new contingency, and ceased to play with girls totally for the remaining weeks with this contingency. Because of the replication of effects, we are reasonably sure that our reinforcement contingency was the variable responsible for the suppression of the feminine behaviors.

Informal Clinical Observations. Post-treatment reports from Kraig's parents and neighbors concurred that he is presently indistinguishable from any other boy in terms of gender-related behaviors. Neighbors who had known Kraig for several years, spontaneously offered exclamations

to the parents regarding the reversal in Kraig's behavior from predominantly feminine to appropriate masculine. By week number 40, Kraig's parents reported spontaneous comments from Kraig such as, "I don't want to wait for the school bus with Mary anymore; I want to wait with Kenny," and "No, I don't like to play with girls' things; where are the boys' toys?"

Before therapy, Kraig was a "crybaby" being afraid to hurt himself in rough games; after the reinforcement therapy, Kraig was playing with "rough-neck" Kenny next door to the extent that Kraig was acquiring Kenny's mildly destructive and reckless behaviors. Interestingly enough, Kraig's mother began to complain to us that her son had become a "rough-neck" and was thereby in danger of getting hurt in reckless play and that he endangered furniture and other household items. We reassured the mother that such "mildly delinquent" behavior was much easier to correct in future years than feminine behaviors would be. The mother finally concluded that she should change her own attitude and should cease being "over-protective," in order to accept Kraig as a normal, active boy.

Prior to therapy, the mother had felt personally responsible for Kraig's pathology and she reported considerable guilt feelings. After treatment, however, she felt as though she had been able to actively correct her "wrong doing," by being the therapist.

In conclusion, the therapeutic intervention has given every indication of being successful in suppressing overt cross-gender behaviors.

DISCUSSION

The treatment program developed for Kraig demonstrated that reinforcement control could be obtained over cross-gender behavior. In addition, it provided information regarding the specificity of the treatment effects. This finding might be considered as an initial therapeutic step towards normalizing the sex-role behaviors of feminine boys. It should be emphasized, however, that this study was not designed to assess the long-term effect of this behavioral intervention, with regard to the primary prevention of subsequent adult transsexualism, transvestism, or some forms of homosexuality.

The results indicated: 1) the successful suppression of feminine behaviors in the clinic setting, and 2) the successful use of a contingency management program in the home. The mother served as the therapist in both settings.

Control over performance or acquisition of new behavior

The data from the clinic treatment study of Kraig provides information regarding the pathological variables underlying cross-gender behavior. From the social learning framework, it might be expected that the therapeutic reinforcement contingency would result in an acquisition learning curve for masculine behavior, with an extinction curve for

feminine behavior. The long clinical history of Kraig's cross-gender behavior suggests that the acquisition of masculine behaviors and the extinction of feminine behaviors might be a very gradual process, necessitating complex shaping procedures to establish a verbal repertoire of predominantly masculine themes and to establish masculine patterns of play behavior. This would hold true if the boy had, in fact, a genuine behavioral deficit in the area of gender-appropriate play and verbal responses. The clinic data for Kraig suggests, in contrast, that the appropriate play and verbal behaviors existed in the child's behavioral repertoire. (This is only to suggest that Kraig had the few masculine play behaviors required for play in the clinic play room. He may have marked deficits in other "everyday" masculine behaviors.) The immediate change to gender-appropriate responses with the instatement of the therapeutic reinforcement contingency is likely a discrimination of the reinforcement contingency. The immediate increase of masculine responding suggests that the therapeutic reinforcement contingency effected a change in performance rather than the acquisition of a new operant. The immediate reversal to feminine responding with the removal of the contingency is more characteristic of stimulus control rather than reinforcement control.

Control over sex-typed verbal behavior

In the laboratory setting, at least, it appeared to be more difficult to obtain reinforcement control over verbal behavior than non-verbal play behavior. In the clinic treatment study of Kraig, the changes in non-verbal behavior were clear and consistently a function of the experimental conditions. While the verbal behavior generally tended to follow the qualitative changes occurring with the non-verbal behavior (i.e., with respect to the masculine-feminine dichotomy), the correlation between masculine non-verbal and masculine verbal behavior was weak; the correlation between feminine non-verbal and feminine verbal was also weak.

Perhaps the variables which control verbal behavior in this setting were too numerous and complex for systematic investigation with the present experimental procedure. Part of the difficulty in obtaining strong control over sex-typed verbal behavior using this intra-subject design may be attributable to the large percentage of verbal behavior rated as "neutral" in content. This contrasts with the non-verbal play observations where the very stimulus objects present restricts the child's behavior to either masculine or feminine play, with no "neutral" option.

It should be noted, nevertheless, that some reinforcement control over gender-related verbal behavior was in fact demonstrated in the clinic study with Kraig. However,

the strength of the effect was not comparable to the strength of the reinforcement control over non-verbal behaviors. The apparent weakneww of the effect upon verbal behavior could mean that feminine speech was difficult for Kraig to discriminate. Future research should be addressed to this question.

Generalization of treatment effect

By obtaining a multiple baseline of several behaviors across several stimulus environments, it was possible to assess, in part, whether or not the treatment effect was generalized (a) across behaviors within a given stimulus environment, and/or (b) across stimulus environments within a given behavior. For example, if the S^{r-} contingency is applied successfully to feminine play in the clinic, two types of generalization may occur: (a) untreated feminine gestures may decrease simultaneously in the clinic, or (b) feminine play may decrease simultaneously in the untreated environment of the home. We will discuss the extent of (a) response generalization and (b) stimulus generalization of our treatment effects under separate headings.

Response generalization of treatment effect. Conclusions regarding the generalization of treatment effects across behaviors within stimulus settings could be made from the data collected (a) in the home where multiple behaviors

were recorded while the treatment variable was introduced for only one behavior at a time, and (b) in the clinic where we tested for generalization in the therapist's presence to a new set of "generalization toys."

We found relatively little evidence for response generalization of treatment effects. In most situations, we found that the treatment was specific to the behavior to which it was applied. There were two possible exceptions to our data: (1) "Female role play" for Kraig might have been suppressed by our treatment of "doll play." The evidence is equivocal, however, since "female role play" was at a low rate of frequency in the initial baseline period and in fact decreased to zero for the two weeks preceding any reinforcement intervention for a feminine behavior at home. Consequently, no definitive evidence accrued for any generalization of treatment across behaviors during the treatment in the home.

(2) In the clinic treatment study of Kraig, we found generalization of treatment effect across behaviors, within the stimulus environment of the therapist's presence. Kraig's sex-typed behavior was feminine before treatment; after therapy, we conducted generalization test sessions in which Kraig played with a new set of toys ("generalization toys") in the therapist's (the mother's) presence. We found predominantly masculine behavior, indicating complete

generalization to the different play behavior required with the new set of toys. However, only weak generalization, if any, was found to play with those new toys in the "alone" play condition. This suggests that the mother in the clinic room had become discriminative for masculine play. Feminine play resumed in the "alone" condition with the generalization toys. This indicated that the treatment effect did not generalize simultaneously (a) across play behavior and (b) across stimulus environments. The response generalization was limited to the stimulus condition defined by the mother's presence. Additional research is needed to determine the treatment conditions under which maximal generalization may be obtained.

Stimulus generalization of treatment effect. The clinic treatment did not generalize to the home for Kraig. In the clinic, Kraig's mother's presence (without differential reinforcement contingencies) became discriminative for his masculine behavior, but this stimulus control did not generalize to the mother's presence in the home. In one situation, we did find evidence for generalization of treatment effects across stimulus environments: within the clinic, across social stimulus conditions. In the clinic, we found that the repeated treatment sessions for Kraig resulted in generalization effects from the therapist-present to the stranger-present conditions. The probability of obtaining

stimulus generalization is some function of the similarity of those two stimulus conditions (cf., Terrace, 1966). Consequently, we would predict more generalization of treatment effect across stimulus conditions within the clinic play room than we would predict from the clinic to the home.

In general, it may be concluded that the treatment effects tended to be narrowly specific to the particular stimulus environment in which they were introduced. When generalization did occur, however, it was where it would be most expected: where the stimulus environments were quite similar.

Conclusions on generalization of treatment effects

The major portion of the evidence in this study indicated that the treatment effect tended to be very specific with regard to the behavior and the stimulus situation in which it was applied. Kraig tended to sharply discriminate the reinforcing consequences for each feminine behavior in each environment. The child's cross-gender behavior was a principal function of its short-term environmental consequences and antecedents. This finding was consistent with Wahler's (1969) study which found the effects of child behavior therapy to be setting-specific; he reported that treatment effects in the home did not generalize to the same behaviors in the school. To facilitate optimal therapeutic effects, therefore,

it was necessary to treat each feminine behavior individually in each major setting in which they occurred.

We are in the process of replicating this study with eight more boys. Our preliminary results are consistent with our findings for Kraig. Even so, our conclusions are currently limited by the small number of subjects in our treatment study. However, our data has strongly suggested that feminine boys are capable of fine discriminations with regard to the reinforcing consequences for their behavior, and that they will continue to perform their feminine behaviors in environments where negative conseuqences are absent (at least in the initial phases of treatment). Our current research is addressed to the issue of maximizing the generalization of treatment effects for these boys, both across behaviors and across stimulus environments.

Concluding discussion

The findings of our research program underscore the importance of obtaining multiple behavioral measures of sex-typed behavior in several stimulus environments, in to delineate causal relationships between environmental variables and sex-role development in children. The effects of our behavioral treatment for boyhood effeminacy have been found to be largely stimulus-specific and response-specific.

We prefer a social-learning theory interpretation of our data (over the alternatives of identification theories

or the "cognitive-developmental" theory), primarily because the social-learning hypothesis includes the possibility that cross-gender behaviors may be stimulus-specific and response-specific. According to the social-learning hypothesis, certain environmental events may become discriminative for the performance of specific gender-related behaviors, insofar as reinforcement may be delivered in some situations and not in others. Many variables may interact with the sex of the child to determine the probable direct and vicarious consequences to which various sex-typed behaviors are likely to lead in various stimulus situations. Mischel (1970) has suggested that some of the relevant variables which combine to determine reinforcement consequences for child behavior, include the following: the type of behavior, the setting in which it occurs, the child's age, status, and other attributes, and the characteristics of the social agents who evaluate him in a given setting.

> Considering the large number of environmental determinants of response consequences, it becomes understandable that children learn to discriminate sharply and show only modest consistency even across seemingly similar situations (Mischel, 1970, p. 59).

Mischel's theorizing from the social-learning framework is consistent with the stimulus-specificity and response-specificity we found in our investigation of pathological sex-role behavior in boys.

The behavioral treatment was effective in decreasing the frequency of feminine behaviors in Kraig. However, due to the variety and persistence of the original (baseline) behaviors, the process of reinforcement control has taken months of systematic application of the contingencies to achieve the desired effects. It was necessary to apply the treatment to several behaviors in several stimulus situations; otherwise we observed very circumscribed changes only. While the behavioral treatment was successful in normalizing several crucial sex-role behaviors in Kraig, no conclusion can be made regarding the effectiveness of this approach for the primary prevention of adult forms of transsexualism, transvestism, or homosexuality. Our long-term follow-up will determine the ultimate therapeutic benefit of this form of behavioral treatment with regard to adult sexual adjustment of these boys. No assumptions are made currently regarding potential permanent changes in the child's "gender identity," as conceived by analytically-oriented clinicians. While the present research was not addressed to the broader issue of therapeutic change of "gender identity," it suggests the need for future research on the dynamic assessment of results obtained by the behavioral treatment of feminine boys.

We have found only tangential support for our specific findings in the literature. For example, Myrick's (1970)

case study reported changes in feminine behavior after counselling with the boy's teacher. Similarly, Green, Newman, and Stoller (1972) presented clinical summaries for five cases, where a variety of therapeutic techniques are described in very general terms. Both of these reports were case studies, however, in which experimental procedures were not used to assure that the treatment intervention was indeed responsible for the change in cross-gender behavior. In one of the more recent reviews of the literature on sex-typing, Mussen (1969) observed that "...there are no definitive studies relating reliable and objective observations of parental rewards and punishments to children's sex-typed behavior" (pp. 714-715). This investigation of reinforcement control over cross-gender behavior in a male child appears to be the first experimental study on the subject.

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